

BULLETIN

OF THE INSTITUTE OF METALS

VOLUME 3

FEBRUARY 1956

PART 6

INSTITUTE NEWS

Spring Meeting, London, 10 to 13 April 1956

As previously announced, the 1956 Spring Meeting will be held in London from Tuesday, 10 to Friday, 13 April, inclusive. An interesting programme has been arranged for this meeting, which the Council hopes will be largely attended by members and guests. Visitors will be welcome at the May Lecture and at the scientific and technical sessions; tickets of admission are not required.

It is particularly hoped that members will give their support to the Annual Dinner and Dance, at Grosvenor House. Similar functions held in the past two years were great successes.

All members resident in Europe will receive, separately, a Reply Form for completion in connection with this meeting. Others, resident outside Europe, who intend to be present are asked to apply for Reply Forms.

PROGRAMME

Tuesday, 10 April

Location: Royal Institution, Albemarle Street, W.1.

7.0 p.m. *May Lecture* by Dr. WILLIS JACKSON, F.R.S., on "Ferroelectrics—the Dielectric Analogue of Ferromagnetics".

8.30 for 8.45 p.m. *Council Dinner* in honour of the *May Lecturer*.

Wednesday, 11 April

Morning

Location: Church House, Great Smith Street, S.W.1 (Bishop Partridge Hall).

10.0 a.m. *Annual General Meeting:*

Report of Election of Officers for 1956–57.

Report of Council for the Year ended 31 December 1955.

Report of the Honorary Treasurer for the Financial Year ended 30 June 1955.

Installation of the New President, Major C. J. P. BALL, D.S.O., M.C., F.R.Ae.S.

Presentation of Institute Medals:

Institute of Metals (Platinum) Medal, to Professor GEORGES CHAUDRON.

Rosenhain Medal, to Dr. DONALD MCLEAN.

W. H. A. Robertson Medal and Premium, to Mr. E. J. THACKWELL.

Presentation of Students' Essay Prizes.

Presidential Address: "The History of Magnesium" by Major C. J. P. BALL, D.S.O., M.C., F.R.Ae.S.

12.0 noon. Adjournment.

Afternoon

Location: Church House, Great Smith Street, S.W.1 (Hoare Memorial Hall).

Chairman: Mr. G. L. BAILEY, C.B.E., M.Sc., F.I.M.

2.30 p.m. *Theme: Materials for Nuclear Power Engineering.* A discussion, based on the following papers, submitted from the United Kingdom Atomic Energy Authority, which will be published in the March issue of the *Journal*.

"Metallurgical Research and Development for Nuclear Power", by H. K. Hardy.

"Metallurgical Research Problems Associated with Nuclear Energy", by J. G. Ball.

"Selection of Canning Materials for Reactors Cooled by Sodium/Potassium, and Carbon Dioxide", by A. B. McIntosh and K. Q. Bagley.

4.30 p.m. approx. Session concludes.

Evening

Location: Grosvenor House, Park Lane, W.1.

7.0 for 7.30 p.m. DINNER AND DANCE. Dress: Evening dress, or uniform, with decorations. Tickets, price 36s., including coffee. Dancing until 1 a.m. to Sidney Lipton's Band. Tables can be booked for private parties of 6, 8, or 10 (or larger, by special arrangement); otherwise members and their guests will be seated with their friends so far as is practicable.

Thursday, 12 April

Morning

PROGRAMME "A"

Location: Church House, Great Smith Street, S.W.1 (Hoare Memorial Hall).

Chairman: The President.

10.0 a.m. *Symposium on "The Final Forming and Shaping of Wrought Non-Ferrous Metals"*, based on the following papers published in the February issue or to be published in the March issue of the *Journal*. The papers will be presented by a rapporteur (Professor F. C. THOMPSON, D.Met., M.Sc., F.I.M.).

"Research in Some Metal-Forming and Shaping Operations", by W. Johnson.

"The Deep Drawing and Spinning of Sheet Metal, with Particular Reference to Non-Ferrous Materials", by J. A. Grainger (Serial No. 1671; Feb. 1956).

"Rubber Pressing", by J. Fielding (Serial No. 1672; Feb. 1956).

"Stretch-Forming of Non-Ferrous Metals", by R. D. Edwards.

"Cold Roll-Forming and Manipulation of Light-Gauge Sections", by E. Griffin.

"Bending and Allied Forming Operations", by T. G. Perry.

"The Machining Properties of Non-Ferrous Metals", by D. F. Galloway (Serial No. 1670; Feb. 1956).

"The Hot Forming of Magnesium Alloys", by R. G. Wilkinson.

12.45 p.m. Adjournment of Symposium.

PROGRAMME "B"

Location: Church House, Great Smith Street, S.W.1 (Bishop Partridge Hall).

Chairman: Dr. L. B. PFEIL, O.B.E., A.R.S.M., F.R.S., F.I.M.

10.0 a.m. (a) Theme: *Powder Metallurgy*. A discussion based on the following papers published in the *Journal*, which will be presented by a rapporteur (Dr. J. C. CHASTON, B.Sc., A.R.S.M., F.I.M.):

"Porosity and Permeability Changes During the Sintering of Copper Powder", by G. Arthur (Serial No. 1600; March 1955).

"The Sintering, Fabrication, and Properties of Thorium", by M. D. Smith and R. W. K. Honeycombe (Serial No. 1615; May 1955).

"The Manufacture and Properties of High-Strength Nickel-Tungsten Alloys", by M. Davis, C. E. Densem, and J. H. Rendall (Serial No. 1673; Feb. 1956).

(b) Theme: *Embrittlement and Fracture*. A discussion based on the following papers published in the *Journal*, which will be presented by a rapporteur (Dr. W. A. BAKER, F.I.M.):

"Intercrystalline Fracture of Beta-Brasses Containing Aluminium", by E. C. W. Perryman (Serial No. 1606; April 1955).

"The Effect of Zirconium and Titanium on the Intercrystalline-Cracking Tendency of Beta-Brasses", by E. C. W. Perryman and R. J. Goodwin (Serial No. 1607; April 1955).

"The Mechanism of Embrittlement by a Liquid Phase", by R. Eborall and P. Gregory (Serial No. 1662; Dec. 1955).

12.45 p.m. Session concludes.

Afternoon

PROGRAMME "A"

Location: Church House, Great Smith Street, S.W.1 (Hoare Memorial Hall).

Chairman: Mr. W. J. THOMAS, M.I.Mech.E., M.I.E.E.

2.30 p.m. Symposium on "The Final Forming and Shaping of Wrought Non-Ferrous Metals", continued.

5.0 p.m. Symposium concludes.

PROGRAMME "B"

Location: Church House, Great Smith Street, S.W.1 (Convocation Hall).

Chairman: Dr. N. P. INGLIS, M.Eng., F.I.M.

2.30 p.m. Theme: *Rolling Textures and Recrystallization*. A discussion based on the following papers published in the *Journal*, which will be presented by a rapporteur (Dr. T. L. RICHARDS, B.Sc., F.I.M.):

"Surface Nucleation in the Recrystallization of Aluminium Single Crystals", by C. D. Graham and R. Maddin (Serial No. 1582; Jan. 1955).

"Deformation and Annealing Textures in Thorium", by R. E. Smallman (Serial No. 1613; May 1955).

"Textures in Face-Centred Cubic Metals and Alloys", by R. E. Smallman (Serial No. 1649; Sept. 1955).

"On the Recrystallization of Cold-Rolled Commercially Pure Titanium", by I. Obinata and K. Nishimura (Serial No. 1664; Jan. 1956).

5.0 p.m. Session concludes.

Evening

Location: 4 Grosvenor Gardens, London, S.W.1.

7.30 p.m. to 11 p.m. *Informal Conversazione and Exhibition of Materials Employed in Nuclear-Energy Engineering*. Dress: Lounge suits. Tickets, price 6s. each, inclusive of light refreshments.

Friday, 13 April

Morning

Location: Lecture Theatre of the Institution of Naval Architects, 10 Upper Belgrave Street, London, S.W.1 (near Belgrave Square).

Chairman: Professor G. V. RAYNOR, M.A., D.Sc.

10.0 a.m. Theme: *Alloy Thermodynamics*. A discussion, arranged by the Metal Physics Committee, to be opened by Dr. J. FRIEDEL (Paris).

12.45 p.m. Session concludes.

"The Beginnings of Metallography"

A lecture entitled "The Beginnings of Metallography" will be given by Professor CYRIL STANLEY SMITH (Director of the Institute for the Study of Metals, Chicago) at a general meeting of the Institute to be held at 4 Grosvenor Gardens, London, S.W.1, on Wednesday, 25 April 1956, beginning at 6.45 p.m. The lecture, which has been arranged by the Metal Physics Committee, is open to all interested, without ticket.

Factory Equipment Exhibition

The Fourth Factory Equipment Exhibition is being held at Earls Court, London, from 9 to 14 April 1956. A complimentary ticket for the exhibition is being enclosed with each copy of this issue of the *Journal*. Members may care to note that the exhibition is being held in the same week as the Institute's Spring Meeting.

Award of Institute Medals

The Council of the Institute has made the following awards of medals:

The Institute of Metals Medal in Platinum for 1956 to Professor GEORGES LEON CHAUDRON, Dr.èsSci., Membre de l'Académie des Sciences (Professeur à la Sorbonne; Directeur du Laboratoire de Vitry du Centre National de la Recherche Scientifique), in recognition of his outstanding contributions to knowledge, particularly in the field of the light metals, which have greatly benefited the metal industries.

The Rosenhain Medal for 1956 to Dr. DONALD McLEAN (Principal Scientific Officer, Metallurgy Division, National Physical Laboratory, Teddington) in recognition of his outstanding contributions to knowledge in the field of physical metallurgy.

The W. H. A. Robertson Medal for 1955 and Premium of Fifty Guineas to Mr. E. J. THACKWELL (Northern Aluminium Co., Ltd., Rogerstone, Mon.) for a paper on "The Choice and Construction of Monolithic Linings for Twin-Bath Induction Furnaces for Melting Aluminium Alloys" (*J. Inst. Metals*, 1954-55, 83, 283).

"The Constitutional Diagrams of Alloys : A Bibliography"

A new edition of No. 2 in the Institute's Monograph and Report Series has just been published, under the title: "The Constitutional Diagrams of Alloys: A Bibliography". The first edition, which was compiled by Dr. J. L. Haughton, appeared in 1942 and has been out of print for a number of years.

This monograph consists of references to work that bears on the constitution of binary, ternary, and higher alloy systems, arranged in alphabetical order of the chemical symbols of the metals composing them. Under each system the references are arranged in chronological order, and an asterisk is used to distinguish those papers that contain a new or revised diagram.

In addition to the original references, there are given, in a separate column, the references to abstracts published by the Institute (in the *Journal* up to 1933 and in *Metallurgical Abstracts* since 1934).

The new edition, prepared by Mr. A. Prince, Lecturer in Metallurgy at the University of Southampton, contains approximately twice as many references as the first edition. The Bibliography has been brought up to date to the end of 1954 in as comprehensive a manner as possible, and in the case of many journals work published up to the middle of 1955 has been included.

Copies of the monograph are available from the Institute or through booksellers, prices 35s. (\$5.50) post free. A member may purchase one copy at 17s. 6d. (\$3.00) post free by application to the Secretary.

Election of Members

The following 7 Ordinary Members, 3 Junior Members, and 14 Student Members were elected on 13 December 1955:

As Ordinary Members

BLOCK, Harold H., M.S., Chief Metallurgist, Air Research Manufacturing Co., Division of Garrett Corp., 9851 Sepulveda Boulevard, Los Angeles 45, Calif., U.S.A.
DEARDEN, Alan, A.M.C.T., A.I.M., Metallurgist, Dobson and Barlow, Ltd., Bradley Fold Works, Bolton, Lancs.

EL-GAWLY, Fikri, B.Sc., Dipl.Ing., Mechanical Engineer, Rolling Mill Department, The Egyptian Iron and Steel Co., Cairo, Egypt.

KOSAKI, Masahide, D.Sc., Manager, Technical Research Department, Copper Plant, Sumitomo Metal Industries, 500 Ro-no-wari, Chitose, Minatoku, Nagoya, Japan.

LORD, David Ronald, B.Sc., A.I.M., Chief Metallurgist, The Monotype Corp., Ltd., Salfords, Redhill, Surrey.

NELLIGAN, Jack Edward, B.Sc.(Chem.Eng.), B.Sc.(Met.Eng.), Chief Chemical and Metallurgical Engineer, Jenkins Bros, Ltd., 617 St. Remi Street, Montreal 30, P.Q., Canada.

WEILL, (Mme.) Adrienne R., A.Inst.P., Ingénieur Contractuel, Constructions et Armes Navales, Marine Nationale, 8 Boulevard Victor, Paris 15e, France.

As Junior Members

GILBERT, Colin, B.Sc., Metallurgist, 69 Abertilly Road, Blaina, Mon.

LOCKHART, Malcolm Duncan, Assistant Metallurgist, Test Department, Handley Page, Ltd., Park Street, near St. Albans, Herts.

SUPRINICK, Harry, B.S.(Mech.Eng.), B.S.(Met.Eng.), Instructor, Department of Mechanical Engineering, University of Buffalo, Buffalo 14, N.Y., U.S.A.

As Student Members

BARTON, Peter James, Undergraduate, Department of Metallurgy, University of Cambridge.

BEAUMONT, Ralph, Undergraduate, Department of Metallurgy, University of Cambridge.

BIRKS, Neil, Undergraduate, Department of Metallurgy, University of Sheffield.

CHINOWSKY, Stanley, A.B., Undergraduate, 1018 John Jay Hall, Columbia University, New York 27, N.Y., U.S.A.

GUEST, Graeme Beresford, Undergraduate, New South Wales University of Technology, Sydney, N.S.W., Australia.

KRUBSACK, Walter Leonard, Undergraduate, Department of Mining and Metallurgy, University of Wisconsin, Madison 6, Wis., U.S.A.

LONGSTAFF, Dennis Albert, Undergraduate, Department of Metallurgy, University of Manchester.

MELVILL, Melvill Leopold, B.A., Graduate Student, Department of Metallurgy, University of Cambridge.

MOORE, Colin, Undergraduate, Department of Metallurgy, University of Sheffield.

PEIFFER, Howard Richard, M.S., Metallurgy Department, Pennsylvania State University, University Park, Pa., U.S.A.

TROTZ, Clarence Icelias, Undergraduate, Department of Metallurgy, University of Cambridge.

WATSON, Marcus Ian MacLaren, Undergraduate, Department of Metallurgy, University of Cambridge.

WHALEN, Thomas J., M.S., Department of Metallurgy, Pennsylvania State University, University Park, Pa., U.S.A.

WILLETT, Denis James, Undergraduate, Department of Metallurgy, University of Sheffield.

The following 15 Ordinary Members, 1 Junior Member, and 20 Student Members were elected on 30 December 1955:

As Ordinary Members

ARNOLD, Samuel, Managing Director, Metallo-Chemical Refining Co., Ltd., 22 Marshgate Lane, Stratford, London, E.15.

PERSONAL NOTES

- CLARK, Ernest Hayden, B.A., Librarian, University of Malaya, Cluny Road, Singapore 10.
- DAVIS, Michael, B.Sc., Ph.D., A.Inst.P., Principal Scientific Officer, United Kingdom Atomic Energy Authority (Industrial Group), Culcheth, nr. Warrington, Lancs.
- FETTICH, Professor Victor, Dipl.Ing., Professor and Head of the Department of Metallurgy, University of Ljubljana, Aškerčeva 32, Ljubljana, Yugoslavia.
- FISHEL, Professor Waite P., M.S., Ph.D., Professor of Metallurgy, Department of Chemistry, Vanderbilt University, Nashville 5, Tenn., U.S.A.
- GILL, Charles Burroughs, B.A.Sc., M.S., Ph.D., Deloro, Ont., Canada.
- GOODE, Bruce Alfred, Managing Director, Glover and Goode Base Metals Pty., Ltd., 131 Hyde Street, Footscray, W.11, Vic., Australia.
- HALLWOOD, Stanley William, Chief Metallurgist, Folland Aircraft, Ltd., King's Avenue, Hamble, Southampton.
- LAFFORGUE, Professor Roberto Nicolas, Professor of Chemistry, Naval School (Argentine Navy) and Chemist, Hector Isnardi & Cia., Calle 7 No. 1268/78, Eva Perón, La Plata, Argentina.
- PRADO, Don Javier, LL.D., Consejero-Director, Eduardo K.L. Earle, Fabrica de Metales, Apartado No. 60, Bilbao, Vizcaya, Spain.
- SHEAFFER, Warren A., B.Eng., Metallurgical Engineer, Reading Tube Corp., P.O. Box 126, Reading, Pa., U.S.A.
- STEELE, John, Technical Representative, Foundry Services (S.A.) (Pty.), Ltd., 20 Meson Road, Election Township, Johannesburg, Transvaal, South Africa.
- STEWART, Allan Lindsay, B.Sc., B.E., Director, Standards Association of Australia, Science House, 157 Gloucester Street, Sydney, N.S.W., Australia.
- THOMAS, Goronwy, L.I.M., Development Metallurgist, Edward Curran (Engineering), Ltd., Cardiff.
- WORSLEY, Gordon, B.Sc., A.I.M., Service Group Metallurgist, The Glacier Metal Co., Ltd., Talbot Road, Stretford, Manchester.
- JONES, Keith Wynne, Undergraduate, Department of Metallurgy, University of Liverpool.
- LOY, Brian, Undergraduate, Department of Metallurgy, University of Sheffield.
- MORRELL, Eric Arthur, Undergraduate, Department of Metallurgy, University of Liverpool.
- SABINE, Terence M., B.Sc., Research Student in Metallurgy, Baillieu Laboratory, University of Melbourne, Carlton N.3, Vic., Australia.
- SAFDAR ALI, *Flying-Officer* Mohammed, B.Sc.Eng., Royal Pakistan Air Force, Kot Rukan Din, Kasur (Lahore), Pakistan.
- SEGALL, Robert L., B.Sc., Research Student in Metallurgy, Baillieu Laboratory, University of Melbourne, Carlton N.3, Vic., Australia.
- SMITH, Norman, Undergraduate, Department of Metallurgy, University of Birmingham.
- WEBBER, Stephen John, Undergraduate, Department of Metallurgy, University of Cambridge.
- WESTLAKE, John, Undergraduate, Department of Metallurgy, University of Liverpool.
- WILLENS, Ronald H., M.S., Graduate Student and Research Assistant, California Institute of Technology, 1201 E. California Street, Pasadena, Calif., U.S.A.
- WILSON, Robert Neil, B.Met., Post-Graduate Student, Department of Metallurgy, University of Sheffield.

Binding Cases

Binding cases for the *Journal* Vol. 82 and *Metallurgical Abstracts* Vol. 21 are now available and may be obtained free by members and subscribers on application to the Secretary. Members are reminded that there is no corresponding binding case for the *Bulletin*, as the volume runs for two years. The *Bulletin* section from each monthly issue from September 1953 until August 1954 should, therefore, be retained for binding with the issues of September 1954 to August 1955.

Joint Library and Institute Offices

Will members please note that the Joint Library and the offices of the Iron and Steel Institute and of the Institute of Metals will be closed in future on Saturdays.

PERSONAL NOTES

DR. T. R. ANANTHARAMAN has left the Max-Planck-Institut für Metallforschung, Stuttgart, and is now working as a metallurgist at the Gebr. Schoch Metallveredlungswerk G.m.b.H., Stuttgart-Feuerbach, W. Germany.

DR. G. BULLOCK has been appointed Lecturer in Physical Metallurgy at the University of Birmingham.

DR. H. H. BURTON, English Steel Corp., Ltd., has been nominated President of the Iron and Steel Institute for the year 1956-57.

MR. ROBERT CARR has been appointed Parliamentary Secretary to the Ministry of Labour and National Service.

MR. J. J. CARTER has been appointed Senior Lecturer in Metallurgy at the University of Otago, Dunedin, New Zealand. He was formerly a metallurgist with Broken Hill Associated Smelters, Port Pirie.

PROFESSOR C. W. DANNATT has been elected President of the Institution of Mining and Metallurgy for the year 1956-57.

As Junior Member

- HARMON, Edward Lansing, Jr., M.S., Research Assistant, Case Institute of Technology, 10,900 Euclid Avenue, Cleveland 6, Ohio, U.S.A.

As Student Members

- BALDOCK, Peter John, Apprentice Metallurgist, West Works Laboratory, The Bristol Aeroplane Co., Ltd., Patchway, Bristol.
- CATHERALL, Eric Alan, Undergraduate, Department of Metallurgy, University of Birmingham.
- COAKHAM, John William, Undergraduate, Department of Metallurgy, University College, Swansea.
- ELLIS, Trevor, Undergraduate, Department of Metallurgy, University of Liverpool.
- FITZGERALD, Leo Michael, B.Sc., Research Scholar, Department of Metallurgy, University of Melbourne, Carlton N.3, Vic., Australia.
- GRAY, Peter Michael, Undergraduate, Department of Metallurgy, University of Liverpool.
- HILLS, Arthur William David, Undergraduate, Department of Metallurgy, University of Cambridge.
- HUMPHREYS, James Graham, Undergraduate, Department of Metallurgy, University of Liverpool.
- JERATH, Ram Pratap, B.Sc., M.Sc.Tech., Graduate Student, Department of Mining and Metallurgy, University of Wisconsin, Madison, Wis., U.S.A.

DR. F. A. FOX has been awarded the Florence Taylor Medal of the South Australia Branch of the Australian Institute of Metals.

MR. P. F. HANCOCK, Research Manager of Birlec, Ltd., has been appointed a director of the company.

MR. E. R. PERRY has been appointed a Development Officer in the Platinum Metals Division of the Development and Research Department of The Mond Nickel Co., Ltd., Acton.

MR. J. W. POKORNY has resigned from the British Thomson-Houston Co., Ltd., and has joined the Research Department of Imperial Chemical Industries, Ltd., Metals Division, Birmingham.

MR. JAMES T. RICHMOND has been appointed a Director of Laporte Titanium, Ltd., Luton.

MR. R. SMITH has resigned his lectureship in metallography in the University of Melbourne to become a research officer with the Australian Atomic Energy Commission.

DR. HILL W. WORNER has been appointed to the Chair of Metallurgy in the University of Melbourne. He succeeds his brother, Dr. Howard K. Worner, who has been appointed Director of Research to the Broken Hill Pty. Co., Ltd.

MR. J. C. WRIGHT has left the Research Department of Imperial Chemical Industries, Ltd., Metals Division, to become a Senior Research Fellow at the Wolverhampton and Staffordshire Technical College.

MR. J. G. YOUNG has been awarded the Sir William J. Larke Medal for 1955 by the Institute of Welding for his paper: "Construction of the All-Welded Twin-Screw Auxiliary Motor Yacht *Morag Mohr*".

Death

The Editor regrets to announce the death of:

LIEUTENANT-GENERAL SIR RONALD CHARLES, K.C.B., C.M.G., D.S.O., on 24 December 1955, at the age of 80. After a distinguished military career, Sir Ronald joined the board of The British Aluminium Co., Ltd., in 1934. He was Honorary Treasurer of the Institute from 1940 to 1945.

OTHER NEWS

Symposium on the Extraction Metallurgy of Some of the Less-Common Metals

The Institution of Mining and Metallurgy is organizing a Symposium on the Extraction Metallurgy of Some of the Less-Common Metals, which will be held at the Royal Society of Arts, John Adam Street, London, W.C.2, on 22 and 23 March 1956. The purpose of the Symposium is to discuss recent developments in extraction metallurgy, particularly in relation to the less-common metals, in view of the rapidly increasing interest in these metals and the need to develop extraction methods applicable to low-grade raw materials.

The discussions will be based on a series of papers which will be available in proof form in advance of the meeting. Attendance is open to all interested. A charge of £1 10s. will be made to members of the Institution and £3 to non-members. This will entitle them to receive a set of advance copies of papers and one copy of the volume of proceedings of the Symposium which will subsequently appear.

Further information can be obtained from the Institution of Mining and Metallurgy, 44 Portland Place, London, W.1.

Third International Light Metals Convention, Leoben, 1956

On 7-9 June 1956 the Third International Light Metals Convention will be held at the Montanistische Hochschule, Leoben, Austria. As was the case at previous conventions in 1934 and 1948, a survey will be given of the current state of development of the light metals. Lectures will be given by leading authorities from Europe, Canada, and the U.S.A., and will cover the following fields: Light Metals in the National and World Economy; Metallurgy of the Light Metals (Al, Mg, Ti); Technology of Light Metals; Metallography and Physics of the Light Metals; and Development of the Light Metals.

A detailed programme will be published early in 1956. Information may be obtained from the Committee of the Third International Light Metals Convention, Montanistische Hochschule, Institut für Metallkunde, Leoben/Stmk., Austria.

Conference on Properties of Materials at High Rates of Strain

The Council of the Institution of Mechanical Engineers, in collaboration with its Applied Mechanics Group Committee, is taking steps to organize a Conference on the Properties of Materials at High Rates of Strain, to take place in London in March 1957. The materials under consideration at this conference will include only those used in the manufacture of mechanical-engineering structures or elements, and will exclude fluids. The conference will largely take the form of the presentation and discussion of a series of papers, and arrangements will be made to issue copies of these in advance. The meeting will probably last from two to three days. It is expected that the papers will be grouped under six main subject headings as follows: (a) Metal Physics; (b) Experimental Techniques; (c) Wave Propagation Strain-Rate Effects on Small Strains; (d) Metal Working; (e) Metals; and (f) Basic Properties.

The Council is ready to consider the publication of manuscripts submitted in connection with this proposed conference. To allow sufficient time for the refereeing of manuscripts, the latest date for submission to the Secretary will be 30 September 1956, but authors should notify the Secretary as early as possible of their intention to submit a paper.

Symposium on "Structure on a Scale Between the Atomic and the Microscopic"

The International Union of Crystallography is to hold its 1956 Symposium in Madrid from 2 to 7 April. This Symposium will be devoted to "Structure on a Scale Between the Atomic and the Microscopic", and it is intended to bring together results obtained by methods such as X-ray and electron diffraction and electron microscopy. Several sessions of the Symposium will be devoted to metals, at which such subjects as zones in alloys and crystalline defects in metals will be discussed. New developments in diffraction techniques related to the subject of the Symposium will be reported at an open meeting of the Commission on Crystallographic Apparatus, to be held in conjunction with the Symposium. Although the meetings are primarily intended for specialists, all crystallographers and electron microscopists will be welcome.

Excursions will take place before and after the Symposium.

All correspondence regarding the Symposium should be addressed to M. Abbad, Secretario del Comité Local de Organización, U. I. Cr., Instituto de Física "Alonso de Santa Cruz", Serrano 119, Madrid, Spain.

DIARY

The Institute

- 24 February. Informal Discussion on "Furnace Refractories for the Use of the Non-Ferrous Metal Industries". (Engineering Lecture Theatre, The University, Edgbaston, Birmingham 15, at 10 a.m.)

Local Sections and Associated Societies

- 15 February. **Manchester Metallurgical Society.** "The Mechanical Properties of Metals", by Professor R. W. K. Honeycombe. (Lecture Room of The Central Library, Manchester, at 6.30 p.m.)
- 20 February. **Sheffield Local Section.** "Aluminium in Engineering", by Dr. E. G. West. (Engineering Lecture Theatre, The University, St. George's Square, Sheffield 1, at 7.30 p.m.)
- 23 February. **Birmingham Local Section.** "Fatigue Loads and Their Effect on Aircraft Structures", by J. Taylor. (Birmingham Exchange and Engineering Centre, Stephenson Place, Birmingham, at 6.30 p.m.)
- 29 February. **Manchester Metallurgical Society.** "British Iron and Steel Research Association Research on: (1) Electric Furnaces; (2) Ingots", by W. H. Glaisher. (Lecture Room of The Central Library, Manchester, at 6.30 p.m.)
- 1 March. **Birmingham Local Section.** "Stress-Corrosion", by Dr. T. P. Hoar. (James Watt Memorial Institute, Great Charles Street, Birmingham, at 6.30 p.m.)
- 1 March. **Leeds Metallurgical Society.** "Extrusion", by J. Crowther. (Large Chemistry Lecture Theatre, The University, Leeds 2, at 7.15 p.m.)
- 1 March. **Liverpool Metallurgical Society.** Conversation.
- 1 March. **London Local Section.** "Metals for Chemical Engineering", by F. H. Keating. (4 Grosvenor Gardens, London, S.W.1, at 6.30 p.m.)
- 6 March. **Oxford Local Section.** "Beryllium", by G. C. Ellis. (Ballroom of the Cadena Café, Cornmarket Street, Oxford, at 7.0 p.m.)
- 6 March. **South Wales Local Section.** "Metal-Finishing Processes", by Dr. G. E. Gardam. (Department of Metallurgy, University College, Singleton Park, Swansea, at 6.45 p.m.)
- 8 March. **Liverpool Metallurgical Society.** "Recent Developments in Casting and Moulding Techniques", by Dr. A. H. Sully. (The Liverpool Engineering Society, 9 The Temple, Dale Street, Liverpool, at 7.0 p.m.)
- 14 March. **Manchester Metallurgical Society.** "Radiation Damage in Metals", by Dr. W. M. Lomer. (Lecture Room of The Central Library, Manchester, at 6.30 p.m.)
- 14 March. **Scottish Local Section.** "Uses of Oil Fuel in Melting Furnaces", by T. Chippindale, followed by Annual General Meeting. (Institution of Engineers and Shipbuilders in Scotland, 39 Elmbank Crescent, Glasgow, C.2, at 6.30 p.m.)

Other Societies

- 15 February. **Institute of Welding, West of Scotland Branch.** "Welding at the Atomic Plants",

by L. Rotherham. (Institute of Engineers and Shipbuilders in Scotland, 39 Elmbank Crescent, Glasgow, C.2, at 7.0 p.m.)

- 16 February. **Institution of Mining and Metallurgy.** General Meeting. (Rooms of the Geological Society, Burlington House, Piccadilly, London, W.1, at 5.0 p.m.)
- 16 February. **Institute of Welding, Southampton Branch.** "Metallurgy", by A. Prince. (Technical College, St. Mary's Street, Southampton, at 7.0 p.m.)
- 21 February. **Institute of British Foundrymen, Slough Section.** "Ferrous Die-Castings", by C. A. Payne. (Lecture Theatre, High Duty Alloys, Ltd., Slough, at 7.30 p.m.)
- 22 February. **Institution of Locomotive Engineers.** "Ultrasonic Flaw Detection", by B. R. Byrne. (Institution of Mechanical Engineers, 1 Birdcage Walk, London, S.W.1, at 5.30 p.m.)
- 22 February. **Society of Chemical Industry, Corrosion Group.** "Control of Corrosion in the Dairying Industry", by G. H. Botham and E. L. Crossley. (Chemical Society, Burlington House, Piccadilly, London, W.1, at 6.30 p.m.)
- 27 February. **Royal Institute of Chemistry, London Section.** "The Extraction and Uses of Titanium and Zirconium", by Dr. J. W. Rodgers. (Joint meeting with the Woolwich Polytechnic Scientific Society.) (Woolwich Polytechnic, S.E.18, at 7.30 p.m.)
- 1 March. **Institute of Welding, North-Eastern Branch (Tees-Side).** "Development in Radiographic Testing of Welds", by T. Brown. (Cleveland Scientific and Technical Institution, Corporation Road, Middlesbrough, at 7.30 p.m.)
- 1 March. **Institute of Welding, North-Eastern Branch (Tyneside).** "Welded Aluminium Deck-Houses", by W. Muckle. (Mining Institute, Neville Hall, Newcastle-on-Tyne, at 7.0 p.m.)
- 5 March. **Institute of Welding, Sheffield Branch.** "Developments in Resistance Welding", by Dr. H. G. Taylor. (Grand Hotel, Sheffield, at 7.15 p.m.)
- 7 March. **Institute of Welding, Manchester Branch.** "Welding in Marine Engineering", by J. A. Dorrat. (Reynolds Hall, College of Technology, Manchester, at 7.15 p.m.)
- 8 March. **Institute of British Foundrymen, Beds./Herts. Section.** "Investment-Casting Process", by D. F. B. Tedds. (Small Assembly Room, Town Hall, Luton, at 7.30 p.m.)
- 13 March. **Institute of Welding, Liverpool Branch.** "Automatic Welding Developments", by R. L. Swan. (Liverpool College of Technology, Byrom Street, Liverpool, at 7.15 p.m.)
- 14 March. **East Midlands Metallurgical Society.** "Production, Fabrication, and Properties of Titanium and Some Titanium Alloys", by Dr. N. P. Inglis. (Nottingham & District Technical College, Shakespeare Street, Nottingham, at 7.30 p.m.)
- 14 March. **Institute of Welding, South London Branch (Medway Section).** "The Training of Welders", by F. Clark and J. Strevens. (Sun Hotel, Chatham, at 7.45 p.m.)

APPOINTMENTS VACANT

A SENIOR INVESTIGATOR is required to direct the activities of a group of people engaged in applied research into metallurgical problems connected with the rolling, extrusion, and forging of aluminium alloys. Familiarity with works processes and some research experience would be a decided advantage. The salary will be attractive and in accordance with age and experience. A pensions scheme is in operation. Apply to: The Director of Research, Aluminium Laboratories Limited, Banbury, Oxon.

COLLEGE OF TECHNOLOGY, BIRMINGHAM

Applications are invited for the post of Lecturer to specialize in the teaching of General and Industrial Metallurgy. The Candidates should have an Honours Degree in Metallurgy of a British University or equivalent, together with some teaching experience, and also some experience of Metallurgical Research or Industry. Responsibilities include teaching to Honours B.Sc. (Metallurgy) and A.I.M. standards, together with participation in the postgraduate and research work of the department. Salary will be in accordance with the Burnham (Further Education) Scale for Lecturers (Men) £965 × £25 to £1065. The successful candidate will be expected to take up the post as soon as possible. Further particulars and form of application may be obtained from the Registrar, College of Technology, Suffolk Street, Birmingham 1, and completed forms should be returned to him not later than two weeks after the appearance of this advertisement.

K. R. PILLING

Clerk to the Governing Body.

G.K.N. GROUP RESEARCH LABORATORY requires a Metallurgist to carry out work in the field of titanium and its alloys. Candidate must have 1st or 2nd Class Honours Degree in Metallurgy and at least 2 years' post-graduate experience. Applications, in writing, giving full details, should be made to the Director of Research, G.K.N. Group Research Laboratory, Birmingham New Road, Lanesfield, Wolverhampton.

IMPERIAL SMELTING CORPORATION, LIMITED, requires Physical Metallurgist with degree or equivalent in Metallurgy and experience of the practical application of Physical Metallurgy work, preferably in a Research Department, to carry out a programme of laboratory investigational work on alloys and some technical service work in the Research Laboratory. Applications to Personnel Manager, Imperial Smelting Corporation, Ltd., St. Andrew's Road, Avonmouth, quoting reference MET/IM.

METALLURGIST (age 21-28), completed National Service, required to undertake wide variety of ferrous and non-ferrous work in connection with research on machining and cold forming of metals. Modern equipment. The position is permanent and there are good opportunities for advancement. Pension scheme. Full details, including age, experience, qualifications, and present salary, to Secretary, Production Engineering Research Association, Melton Mowbray, Leics.

METALLURGISTS or METALLURGICAL CHEMISTS, B.Sc., or equivalent, required for Tin Smelting Works in Singapore and Malaya. Applicants should be not older than 30 years, and preference will be given to single men. First-class passage and free furnished quarters provided. Provident Fund. Salary according to qualifications and experience, but not less than £1200 p.a. Apply, giving full details of age, qualifications, and experience, &c., to Box No. 402, The Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

METALLURGISTS

seeking industrial research posts are invited to apply for vacancies in the laboratories of

THE BRITISH NON-FERROUS METALS RESEARCH ASSOCIATION

Investigators required to study alloy development, marine corrosion, casting, bright annealing of copper alloys, &c. Initial salary in the range of £780-£1100, according to qualifications and experience. Apply: Secretary, 81-91 Euston Street, London, N.W.1.

METALLURGISTS required for control and development of works' processes, including casting, rolling, extruding, and heat-treatment of aluminium and aluminium alloys. Applicants should not



Research Laboratories

NORTH WEMBLEY, MIDDLESEX



GRADUATES

of outstanding and proven ability in research in **PHYSICS, ENGINEERING, CHEMISTRY and METALLURGY**, are required to strengthen the research staff of **THE GENERAL ELECTRIC COMPANY.**

The Research Laboratories at Wembley are in pleasant surroundings yet convenient to the scientific and cultural amenities of London. The range of work and choice of subjects is wide. Scientific publication is encouraged.

The openings provide excellent opportunities for continuing contact with the academic schools of the country while working in association with a progressive manufacturing industry. Salaries offered will be commensurate with the expected standard of ability.



Anyone having the necessary high qualifications who is interested in exploring the opportunities presented by these appointments, is invited to apply to the Staff Manager (Ref. RLO/64), Research Laboratories, The General Electric Co. Ltd., East Lane, North Wembley, Middlesex.

be over 30 years of age, and must be graduates in metallurgy, or expect to graduate in 1956. Please write giving full details, career, and salary expected, to Personnel Manager, Northern Aluminium Co., Ltd., Banbury.

QUALIFIED METALLURGIST aged between 25 and 30 required by steel strip manufacturing company to take control of new laboratory. Applicants should be capable of taking complete responsibility for analytical and metallurgical control of raw materials and heat-treatment processes and for the direction of approved inspection organization. This is a senior staff appointment, and a non-contributory pension scheme is in operation. Applications in writing stating age, qualifications, previous industrial experience, and salary required to: Charles Cooper (Tipton) Limited, Locarno Road, Tipton, Staffs.

RESEARCH LABORATORY

ASSOCIATED ELECTRICAL INDUSTRIES, LTD.

Vacancies exist for GRADUATE SCIENTISTS to undertake long-term research in problems of PHYSICAL METALLURGY much of which is associated with NUCLEAR ENERGY.

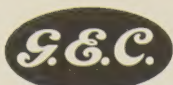
Scientists should have HONOURS DEGREES in PHYSICS, METALLURGY, or CHEMISTRY: some experience of research is desirable. SOME OF THE VACANCIES ARE FOR MEN WITH A VERY CONSIDERABLE AMOUNT OF RESEARCH EXPERIENCE.

The salaries offered will depend on age, qualifications, and experience, and the appointments will be pensionable.

The Laboratory serves a large group of companies. It is situated in pleasant rural surroundings near Reading, with a fast train service to London. Please write giving full details of qualifications and experience, quoting reference no. M/R/GA/2 to Personnel Officer,

ASSOCIATED ELECTRICAL INDUSTRIES, LTD.

Aldermaston Court,
Aldermaston, Berkshire.



METALLURGICAL RESEARCH

The Research Laboratories of The General Electric Co. Ltd., East Lane, North Wembley, Middlesex, are seeking first class Physicists, Physical Chemists and Metallurgists, for an expanding programme of Metallurgical Research in many fields including Atomic Energy.

One senior appointment might be made for which candidates should show evidence of considerable research ability and experience. They would be expected to show the scientific leadership necessary for a post of high responsibility.

Apply in writing to the Staff Manager (Ref. RLO/70), giving full particulars of experience, qualifications and age.

SENIOR METALLURGIST required by THE ENGLISH ELECTRIC CO., LTD., at LUTON for assistance to Designers in the development of Guided Weapons. Experience in the aircraft industry, or the manufacture of component parts in both aluminium and ferrous alloys, is desirable. The work involves a wide knowledge of metals, their application, and methods of fabrication and protection. Salary commensurate with qualifications and experience. Applications in strict confidence to Dept. C.P.S., 336/7, Strand, W.C.2, quoting Ref. 1112D.

THE GUEST, KEEN AND NETTLEFOLDS Group Research Laboratory requires a **PHYSICAL CHEMIST** or **METALLURGIST** for work on gas-metal reactions occurring during the annealing or silicon-iron alloys. The candidate should have a good degree of equivalent qualification. Some knowledge of the thermodynamics of chemical reactions is essential, and 2-3 years' experience of working in a similar field would be an advantage. Applications, giving full details of qualifications and experience, to the Director of Research, G.K.N. Group Research Laboratory, Birmingham New Road, Lanesfield, Wolverhampton. All communications to carry reference number MP.1.

UNIVERSITY GRADUATES are required for employment as Scientific Officers for fundamental research in the fields of metallurgy and solid-state physics and chemistry at a new laboratory of a large industrial organization. The research projects include the study of plastic deformation, fatigue and surface properties of solids, using the latest experimental techniques in electron and X-ray microscopy and diffraction, but experience in these techniques is not essential. Salaries will be in the range £600-1000, according to qualifications and experience. Apply, stating full particulars, to the Secretary, Tube Investments Research Laboratories, Hinxton Hall, near Saffron Walden, Essex.

UNIVERSITY OF BIRMINGHAM

Applications are invited for the post of Research Assistant to the Joseph Lucas Research Fellow. Applicants must possess an honours degree in metallurgy, physics, or chemistry. The successful candidate will be required to undertake research on the structure and mechanical properties of electrodeposits and will be encouraged to submit work for a higher degree. Salary will be in the range £325-£500 per annum. Applications in writing should be made to the Department of Industrial Metallurgy, The University, Birmingham 15.

APPOINTMENT REQUIRED

B.Sc. IN METALLURGY seeks change. Several years' experience on pyrometric instruments, inspection, radiology, corrosion, and corrosion-protection research, patent work and administrative duties. Box No. 403, The Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

EDITORIAL ASSISTANT

An editorial assistant is required for the publications of the Institute of Metals. A qualification in metallurgy, physics, or chemistry and an aptitude for writing are essential; a knowledge of languages is desirable. The post is permanent and pensionable.

Apply, stating experience and salary required, to the Editor, Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.